

Serial No. 10/806,404
October 31, 2005
Reply to the Office Action dated May 31, 2005
Page 2 of 12

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

Claims 1-9 (canceled).

Claim 10 (previously presented): A surface acoustic wave apparatus, comprising:

a piezoelectric substrate;

at least one electrode for a surface acoustic wave element disposed on the piezoelectric substrate;

an electrode pad disposed on the piezoelectric substrate and arranged to be joined with a bump during a bump bonding process performed by a flip chip bonding system; and

a wiring electrode for electrically connecting the electrode pad and the electrode for surface acoustic wave element; wherein

the electrode pad includes a first electrode layer disposed on the piezoelectric substrate and a second electrode layer laminated on the first electrode layer, the first electrode layer including an etched metal film, and the at least one electrode for the surface acoustic wave element including a material formed by a lift-off process; and

a particle size of a conductive particle in the conductive film constituting the second electrode layer and the wiring electrode is smaller than a particle diameter of a conductive particle in one of the electrode for the surface acoustic wave element and the first electrode layer of the electrode pad, which has a smaller film thickness.

Claim 11 (original): The surface acoustic wave apparatus according to Claim 10, wherein the wiring electrode and the second electrode layer are integral with each other and include a common metal film.

Serial No. 10/806,404
October 31, 2005
Reply to the Office Action dated May 31, 2005
Page 3 of 12

Claim 12 (original): The surface acoustic wave apparatus according to Claim 10, further comprising an adhesive layer defining a substrate for the wiring electrode and the second electrode layer, wherein the wiring electrode and the second electrode layer are made of one of an Al and an Al alloy, and the adhesive layer is made one of a metal and an alloy having an adhesion to the first electrode layer that is higher than that of the Al and the Al alloy.

Claim 13 (original): A surface acoustic wave apparatus, comprising:
a piezoelectric substrate;
at least one electrode for a surface acoustic wave element disposed on the piezoelectric substrate;
an electrode pad disposed on the piezoelectric substrate and arranged to be joined with a bump during a bump bonding process performed by a flip chip bonding system; and
a wiring electrode for electrically connecting the electrode pad and the electrode for the surface acoustic wave element, wherein:
the electrode pad includes a first electrode layer disposed on the piezoelectric substrate and a second electrode layer laminated on the first electrode layer;
the second electrode layer and the wiring electrode are integral with each and include the same conductive film; and
end surfaces of joint portions, to be electrically connected with the wiring electrodes, of the first electrode layer and the electrode for the surface acoustic wave element are arranged to have a stepwise configuration.

Claim 14 (original): The surface acoustic wave apparatus according to Claim 10, wherein each of the electrode for the surface acoustic wave element and the first electrode layer of the electrode pad includes at least two end surfaces of the joint portion.

Serial No. 10/806,404
October 31, 2005
Reply to the Office Action dated May 31, 2005
Page 4 of 12

Claim 15 (original): The surface acoustic wave apparatus according to Claim 13, wherein each of the electrode for the surface acoustic wave element and the first electrode layer of the electrode pad includes at least two end surfaces of the joint portion.

Claim 16 (currently amended): A surface acoustic wave apparatus, comprising:
a piezoelectric substrate;
at least one electrode for a surface acoustic wave element disposed on the piezoelectric substrate;

an electrode pad disposed on the piezoelectric substrate and arranged to be joined with a bump during a bump bonding process performed by a flip chip bonding system; and

a wiring electrode for electrically connecting the electrode pad and the electrode for the surface acoustic wave element, wherein:

the electrode pad includes a first electrode layer disposed on the piezoelectric substrate and a second electrode layer laminated on the first electrode layer;

the second electrode layer and the wiring electrode are integral with each other and include a common conductive film; and

the electrode for the surface acoustic wave element and the first electrode layer of the electrode pad, to be connected with the electrode for the surface acoustic wave element, are arranged in contact with each other; and

an upper surface of the electrode for the surface acoustic wave device is disposed at a height that is different than a height at which an upper surface of the first electrode layer is disposed.

Claim 17 (canceled).

Claim 18 (original): The surface acoustic wave apparatus according to Claim 13,

Serial No. 10/806,404
October 31, 2005
Reply to the Office Action dated May 31, 2005
Page 5 of 12

wherein a particle size of a conductive particle in the conductive film constituting the second electrode layer and the wiring electrode is smaller than a particle diameter of a conductive particle in one of the electrode for the surface acoustic wave element and the first electrode layer of the electrode pad, which has a smaller film thickness.

Claim 19 (original): The surface acoustic wave apparatus according to Claim 15, wherein a particle size of a conductive particle in the conductive film constituting the second electrode layer and the wiring electrode is smaller than a particle diameter of a conductive particle in one of the electrode for the surface acoustic wave element and the first electrode layer of the electrode pad, which has a smaller film thickness.

Claim 20 (original): The surface acoustic wave apparatus according to Claim 10, wherein an electrode for a second surface acoustic wave element that is different from the electrode for the surface acoustic wave element is disposed on the piezoelectric substrate, and the electrode for the second surface acoustic wave element includes an etched metal film.

Claim 21 (original): The surface acoustic wave apparatus according to Claim 13, wherein an electrode for a second surface acoustic wave element that is different from the electrode for the surface acoustic wave element is disposed on the piezoelectric substrate, and the electrode for the second surface acoustic wave element includes an etched metal film.

Claim 22 (original): The surface acoustic wave apparatus according to Claim 15, wherein an electrode for a second surface acoustic wave element that is different from the electrode for the surface acoustic wave element is disposed on the piezoelectric substrate, and the electrode for the second surface acoustic wave element includes an etched metal film.